REMARKS

Claims 60-78 were and remain pending. Reconsideration and allowance of these claims are earnestly solicited in view of the following remarks.

Claims 60-78 were rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,076,867 ("McKenzie"). Applicant respectfully traverses this anticipation rejection as applied to independent claim 60.

McKenzie discloses an explosive containing water-in-oil emulsions and ammonium nitrate (AN) and ammonium nitrate fuel oil (ANFO) prills. McKenzie, col. 1, lines 5-27. The Office Action asserts that McKenzie discloses that poly(isobutenyl)succinic acid (PIBSA) is used as a surfactant for the water-in-oil emulsion "formed by mixing nitrite, oxidizer salt, and thiourea and subsequently adding this solution to the emulsifier and fuel." 9/17/07 Office Action, p. 2. McKenzie does not anticipate claim 60 for several reasons.

McKenzie is directed to an inherent instability with emulsion explosives based on emulsion and prill mixtures. McKenzie col. 1, line 49 – col. 2, line 8. If the emulsion is weakened or becomes unstable, crystallization or solidification of droplets results. McKenzie col. 1, lines 56-61. This causes the emulsion to lose sensitivity and become difficult to handle. McKenzie col. 1, lines 56-61. The addition of solid components, such as AN or ANFO prills, to emulsion explosives tends to result in additional destabilization. McKenzie col. 1, lines 61-66. These solid components may disrupt the continuous fuel phase and provide sites for resulting crystallization of the discontinuous oxidizer salt solution phase. McKenzie col. 1, lines 61-66. In addition, prills often contain fines and clay or talc coating and this can poison the emulsion thereby hastening destabilization. McKenzie col. 2, lines 1-3. Thus, McKenzie is directed is enhancing the stability of emulsion explosive compositions containing AN or ANFO prills. McKenzie col. 2, lines 9-19. McKenzie teaches the addition of a surfactant to the AN prills or dissolution of a surfactant in the liquid organic fuel of ANFO prills prior to addition of the liquid fuel to the ammonium nitrate prills (in order to form ANFO prills). McKenzie col. 3, lines 15-30. McKenzie states that "It has been found that use of a surfactant in this manner imparts greatly increased stability to the resulting emulsion and AN or ANFO prills mixture. By 'stability' is meant that the emulsion phase of the emulsion and AN or ANFO prills mixture remains a stable emulsion, i.e. does not appreciably break down or experience crystallization of the discontinuous oxidizing salt phase over a given period of time." McKenzie col. 1, lines 32-39.

McKenzie's use of PIBSA surfactants is directed away from their use in the water-in-oil emulsion. McKenzie col. 3, lines 9- 10. When McKenzie teaches the formation of water-in-oil emulsions, no reference is made to the use of PIBSA-based emulsifiers. McKenzie col. 3, line 31 – col. 4, line 32. McKenzie utilizes PIBSA as additive to the AN or ANFO prills, only. McKenzie col. 3, line 15. Thus, it is quite clear that when a PIBSA surfactant is being discussed in McKenzie it is the surfactant that is added to the prills and not the surfactant that is used in forming the water-in-oil emulsion.

McKenzie teaches sensitizations of water-in-oil emulsions using either chemical gassing agent or through the use of hollow spheres or particles. McKenzie col. 4 lines 33-51. McKenzie identifies preferable chemical gassing agents that are comprised of sodium nitrite that reacts chemically in the composition to produce gas bubbles. McKenzie col. 4 line 33. Gassing accelerators may also be used to accelerate the decomposition process. A sodium nitritelthiourea combination is said to begin producing gas bubbles "immediately upon addition of the nitrite to the oxidizer solution containing the thiourea." McKenzie col. 4, lines 36-39 (emphasis added).

McKenzie never forms a gasser solution and instead teaches a method of chemical gassing using a series of steps. McKenzie col. 4, line 52 – col. 5, line 20. The emulsion is formed conventionally by dissolving the oxidizer salt(s) and other aqueous soluble constituents in water which may also contain the gassing accelerator. McKenzie col. 4, lines 52-65. The aqueous solution is then added to a solution of the emulsifier and immiscible liquid organic fuel and the resultant mixture stirred vigorously to produce an emulsion of the aqueous solution in a continuous liquid hydrocarbon fuel phase. McKenzie col. 4, lines 52-65. When gassing is desired, which could be immediately after formation of the emulsion or up to several months afterwards, the gassing agent (sodium nitrite and unidentified "other advantageous trace additives") are added to and mixed homogeneously throughout the emulsion to produce uniform gassing at the desired rate. McKenzie col. 5, lines 1-8. Thus, it is evident from this that the emulsion is formed in which the gassing accelerator is included in the aqueous phase, with gassing being achieved by addition of the sodium nitrite to the emulsion.

It is clear that McKenzie does not teach each element of claim 60. Applicant therefore submits that McKenzie does not anticipate claim 60. Applicant therefore respectfully requests the withdrawal of the anticipation rejection of independent claim 60, as

well as its dependent claims, which are patentable at least because they depend from claim 60.

Claims 60-78 were rejected under 35 U.S.C. 103(a) as being rendered obvious by U.S. Patent No. 5,076,867 ("McKenzie"). Applicant respectfully traverses this obviousness rejection as applied to independent claim 60.

The Office Action asserts that "It would have been obvious to one having ordinary skill in the art ... to vary the parameters of the emulsion such as pH, amounts and density to achieve the desired result." 9/17/07 Office Action p. 2.

McKenzie use of PIBSA surfactants is directed away from their use in the water-in-oil emulsion. McKenzie col. 3, lines 9- 10. When McKenzie teaches the formation of water-in-oil emulsions, no reference is made to the use of PIBSA-based emulsifiers. McKenzie col. 3, line 31 – col. 4, line 32. McKenzie utilizes PIBSA as additive to the AN or ANFO prills, only. McKenzie col. 3, line 15. Thus, it is quite clear that when a PIBSA surfactant is being discussed in McKenzie it is the surfactant that is added to the prills and not the surfactant that is used in forming the water-in-oil emulsion.

McKenzie's discloses a fundamentally different explosive water-in-oil emulsion. McKenzie teaches to a different problem from the present invention and it is submitted that one skilled in the art would not turn to the disclosure of McKenzie when seeking a solution to the problem to which the present invention is directed. Furthermore, even considering the teaching of McKenzie, this does not disclose or render obvious the method of the present invention as claimed. McKenzie does mention sensitization of an emulsion explosive composition by conventional techniques, but this is fundamentally different from the approach adopted in the present invention. In the circumstances, it is submitted that the disclosure of McKenzie does not render obvious the present invention as claimed.

As stated above, McKenzie does not teach the use of a PIBSA surfactant in the water-in-oil emulsion. Thus, one with ordinary skill in the art would not be able to achieve the results of the present claims through the variation of "parameters of the emulsion such as pH, amounts and density to achieve a desired result." 9/17/07 Office Action p. 2. Additionally, McKenzie does not disclose a gasser solution. Thus, McKenzie fails to provide any motivation to create a gasser solution or "vary the order of the steps of addition of a gasser solution to the emulsion explosive." 9/17/07 Office Action p. 3.

A variety of chemicals are used to achieve in situ generation of gas bubbles in a water-in-emulsion explosive composition. However, perhaps the most widely used chemical

is nitrous acid and its salts which react under conditions of acid pH to produce nitrogen gas bubbles. Gassing accelerators such as thiocyanate salts, iodides, sulphamic acid or its salts or thiourea may be used to accelerate the reaction of a nitrite gassing agent, with the accelerator also being typically consumed in the reaction. U.S. Appl. No. 09/938,649 (O'Hara) p. 3 lines 19-26. However, one of the main problems associated with the use of nitrite gassing agents is that nitroso species are generated during the gassing reaction and these species may react with functional moieties on the head group on the emulsifier that is used to produce the water-in-oil. O'Hara p. 3, line 27 – p. 4, line 10.

Reaction between the nitroso species and the emulsifier causes chemical changes in the emulsifier and this can have a damaging effect on the emulsifying capability of the emulsifier. Specifically, the reaction can result in a breakdown of the emulsion into constituent aqueous and oil phases. O'Hara p. 3, line 27 – p. 4, line 10. This indicates that the reaction between a nitrite gassing agent (such as sodium nitrite) and a known emulsifier, poly(isobutenyl)succinic acid-based (PIBSA-based) emulsifiers, cannot be used in nitrite-gassed emulsion explosive compositions due to problems with subsequent emulsion stability. O'Hara p. 4. lines 1-22.

Another longstanding problem associated with gassing agents, including nitrite gassing agents, is the difficulty of evenly distributing the gassing agent throughout the emulsion. This problem is recognized in International Patent Publication No. WO 89102881 (see page 4, lines 23-29 of the present specification).

It is clear that McKenzie does not render obvious claim 60. Applicant therefore respectfully requests the withdrawal of the obvious rejection of independent claim 60, as well as its dependent claims, which are patentable at least because they depend from claim 60.

Applicant therefore submits that the pending application is in condition for allowance, and earnestly solicits an early notice to that effect.

Should the Examiner believe that anything further is desirable to place the application in better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Application No. 09/938,649
Attorney Docket: 021058-0257402
Client Reference: 2470303/JCC/MXB

Please charge any fees associated with the submission of this paper to Deposit Account Number 033975. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced Deposit Account.

Respectfully submitted,
PILLSBURY WINTHROP SHAW PITTMAN LLP

By: _____
Jack S. Barufka
Registration No. 37,087
Direct No. (703) 770-7712

JSB
1650 Tysons Boulevard
McLean, VA 22101
(703) 770-7900 Telephone
(703) 770-7901 Facsimile

Date: January 16, 2008